



The incorporation of perennials into WA farming systems in the central wheatbelt has been varyingly successful, primarily due to the wide range in climatic conditions and soil fertility over the region. Growers are naturally interested in species that are performing well in other parts of WA, but at this stage the species which have demonstrated their resilience over time are the best options.

In the Northern Agricultural Region (NAR), sub-tropical perennial grasses such as Rhodes grass and Gatton panic have been established by many growers and have proven to be highly productive on poor quality sandy soils. However, these species are sensitive to frost and require warm temperatures for establishment and growth. The key to their success in the NAR is that they continue to grow for most or all of the annual growing season. In contrast, with cooler temperatures and

occasional frosts in the central wheatbelt the grasses are likely to shut down from late autumn until mid-spring, so biomass production will be restricted even if they persist. As a result they may have a limited role in the western part of the region where the growing season is longer. The wetter than normal conditions in spring and early summer has allowed good establishment of sub-tropical grasses by some producers in 2011, but the questions over long-term persistence and productivity remain.

Many temperate perennial grasses which are commonly grown in the eastern states, such as perennial ryegrass, phalaris, cocksfoot and tall fescue are poorly adapted to the conditions in the central wheatbelt, due to the combination of low soil fertility, low annual rainfall and a short growing season. The distinctive summer drought is a major limitation.

What current options may work for you?

There are some perennial pasture options which have shown their resilience under the environmental conditions in the central wheatbelt. The six best perennial pasture options are: lucerne, tall wheatgrass, perennial veldt grass and three shrubs (saltbush, tagasaste, bluebush). The suitability of these six perennials to varying climatic and soil characteristics (Table 1) are highlighted by their high drought tolerance, low rainfall requirements and comparatively low soil fertility requirements.

Table 1: Suitability of perennial species to climatic and soil characteristics of WA.

	Lucerne	Tall wheat-grass	Veldt grass	Saltbush	Tagasaste	Bluebush
Min. rainfall	250mm	350mm	300mm	250mm	300mm	250mm
Clay soils	**	***	NS	NS	NS	NS
Loam soils	***	***	*	*	NS	*
Sandy soils	***	***	***	***	***	***
Soil pH	4.8+	4.5+	4.0+	4.0+	4.0+	4.0+
Salinity tolerance	M	H	U	M	P	M
Waterlogging tolerance	P	H	P	M	P	P
Drought tolerance	H	H	H	VH	H	VH
Frost tolerance	H	H	M	H	M	H

Legend: * = least suitable, **** = most suitable, NS = not suitable
VH = very high, H = high, M = moderate, P = poor, U = unknown

Adapted from DAFWA 'Perennials for out-of-season production' (2005).

Uses in the system - what works where?

Lucerne (*Medicago sativa*) is a deep-rooted legume that is highly palatable and of high feed quality, with metabolisable energy between 8-11 MJ and crude protein between 15-25%. Lucerne has moderate to high soil fertility requirements, and is not suited to waterlogged or saline soils, and the rhizobia are susceptible to soil pH below 4.8. Winter growth varies from dormant to actively growing, though all varieties are very responsive to out-of-season rainfall.

Tall wheatgrass (*Thinopyrum ponticum*) is a summer-active, temperate grass that has been grown on WA saltland since the 1940s, playing a role in lowering shallow water-tables in the management of salinity. Winter growth is slow, and subsoil moisture or rainfall is required for good summer production. Tall wheatgrass is often grown with companion legumes, as the nitrogen promotes increased growth, palatability and nutritive quality.

Veldt grass (*Ehrharta calycina*) is native to South Africa, and is hardy and productive on infertile sandy soils. It is an invasive weed throughout the south-west, but is valued in agricultural systems for its role in stabilising drifting soils. Veldt grass also responds to soil nitrogen provided by companion legumes, and the feed value can be quite high, with metabolisable energy ranging from 7.3-10.7 MJ and crude protein from 9-30%. Production is highest in spring and autumn, becoming dormant after heavy winter frosts.

Saltbush (*Atriplex* spp.) plays a key role in the eastern wheatbelt in the management of salinity, with their long tap roots acting as pumps to reduce water table depths. Saltbush has low soil fertility requirements, growing well on sandy soils that may be deficient in nitrogen and phosphorus. Nutritive value for energy is between 7.1-7.6 MJ, and crude protein ranges from 7-17% in summer to 17-23% in winter.

Bluebush (*Maireana* spp.) is native to the eastern wheatbelt, and like saltbush is used in the management of salinity, as well as providing high quality out-of-season fodder. Metabolisable energy provided is 7-8 MJ, and crude protein ranges from 10-14% in summer to 21-22% in winter. Both bluebush and saltbush are best used as part of a species mix, as they contain moderate oxalate concentrations and are high in salt.

Tagasaste (*Chamaecytisus palmensis*) or tree lucerne is a leguminous shrub that is well adapted to deep, well-drained sandy soils, though it does not tolerate highly acid soils or those with high aluminium content, such as Wodjil sands. Feed quality is greatest in winter and spring, but declines steadily over summer and by autumn tagasaste on its own will only maintain animal live weight. Sheep should be restricted to 6-week grazing intervals as tagasaste contains high levels of phenolic compounds, which interfere with rumen function.

When selecting perennial pastures it is important to note that they require some form of rotational grazing to ensure long-term persistence and to maintain feed quality. Lucerne and veldt grass require rotational grazing for persistence in the long-term, as they can be selectively grazed. Tall wheatgrass requires summer grazing to delay plant maturation and maintain feed quality and palatability. Established saltbush and tagasaste can withstand hard grazing, but rotational grazing is required to allow them to recover between grazings. When grazing tagasaste with sheep, the plants need yearly cutting to prevent them flowering and hence maintain production.

Want to read more on what perennial pastures may work for you then visit www.agric.wa.gov.au/pastures to find some more information.



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